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# Changes in North Carolina's Industrial Roundwood Products Output, 1987-1990

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## Foreword

This report presents the findings of a 1990 canvass of all primary wood-using plants in North Carolina and complements Forest Inventory and Analysis' periodic inventory of volume and removals from southeastern timberland. The canvass was made to determine the amount and source of wood receipts and annual timber product drain by county for a specific year. In addition, interstate and cross-regional movement of industrial roundwood are determined. Only primary wood-using mills are canvassed. Primary mills are those that process roundwood in log or bolt form or as chipped roundwood. Examples of industrial roundwood products are saw logs, pulpwood, veneer logs, poles, and logs used for composite panel products (oriented strand board or waferboard) or reconstituted lumber products (parallel strand lumber, laminated veneer lumber, particleboard). Mills producing products from residues generated at primary processors and secondary processors are not canvassed. Trees chipped in the woods are not included in the estimate of timber drain unless delivered to a primary domestic manufacturer.

A 100-percent canvass of all primary wood-processors in North Carolina was conducted in 1991. Out-of-State mills known to be using logs or bolts harvested from North Carolina timberland were also contacted. Each mill was canvassed by mail or through personal contact at plant locations. Telephone contact was made as a followup to mailed questionnaire responses when additional information or clarification of response was necessary. In the event of a nonresponse, receipt data collected in previous surveys were updated based on current data collected for mills of similar size, product type, and location.

Pulpwood production data are taken from an annual canvass of all eastern pulpmills. Medium density fiberboard, insulating board, and hardboard plants are included in this survey. The pulpwood production survey is conducted annually in cooperation with the American Pulpwood Association. Previous surveys for other timber products have been conducted approximately every 3 years since 1964. This Bulletin reports the findings of the 1990 primary wood users canvass and pulpwood production study in North Carolina, and presents changes in product output and residue use since 1987.

These studies are a cooperative project involving the Southeastern Forest Experiment Station and the North Carolina Department of Environment, Health, and Natural Resources, Division of Forest Resources. The Southeastern Station gratefully acknowledges the cooperation and assistance provided by the North Carolina Division of Forest Resources in collecting mill data. Appreciation is also expressed to forest industry and mill managers for providing timber products information. The information presented in this report is based on responses from over 99 percent of mills operating in 1990. These mills accounted for nearly 100 percent of the 1990 mill receipts. Eight pulpmills, 32 veneer mills, 13 mills manufacturing other industrial products, 5 composite panel mills, and 305 of the 308 sawmills in operation in 1990 provided current mill data.

## Output of Industrial Roundwood Products

Output of industrial roundwood products in 1990 was over 764 million cubic feet, up by 2 percent or 17 million cubic feet from 1987 (table 1). Output of softwood roundwood products increased 4 percent to over 491 million cubic feet, while that of hardwood roundwood products decreased slightly to nearly 273 million cubic feet. Softwood roundwood products accounted for 64 percent of the State's total output of roundwood timber products, 1 percent more than in 1987.

Pulpwood and saw logs were the principal roundwood products in 1990. Combined output of these two products totaled more than 657 million cubic feet, and accounted for 86 percent of the State's total roundwood output.

### Saw Logs

Saw-log production dropped 1 percent between 1987 and 1990 to nearly 327 million cubic feet. Still, output of saw logs accounts for nearly 43 percent of the State's total roundwood products output in 1990 (table 1). Output of hardwood saw logs decreased by more than 10 percent to 103 million cubic feet, while that of softwood saw logs increased nearly 4 percent to 223 million cubic feet. Softwood species accounts for 68 percent of the State's saw-log production, 3 percent more than in 1987.

### Veneer Logs

Since 1987, hardwood veneer output from roundwood increased to 26 million cubic feet, or by 34 percent, while softwood veneer production decreased by 10 percent to 44 million cubic feet (table 1). Softwoods still account for nearly 63 percent of the veneer production. Veneer accounted for 9 percent of the State's output of roundwood timber products, about the same as in 1987.

### Pulpwood

Output of roundwood pulpwood increased 3 percent to nearly 331 million cubic feet in 1990 (table 1). Both softwood and hardwood output increased, but softwood output increased most–nearly 5 percent to almost 204 million cubic feet, nearly 62 percent of pulpwood production. Total pulpwood output accounted for 43 percent of the State's total output of roundwood timber products, about the same as in 1987.

### Composite Panels

Several composite panel mills have come on line in the Southeast in recent years and have utilized a growing proportion of the roundwood timber volume. Prior to 1990, roundwood utilized in composite panels was reported in our publications as other industrial. In 1990, almost 35 million cubic feet of roundwood was used in composite panels, almost 5 percent of the State's total output of roundwood timber products (table 1). About 53 percent was softwood and 47 percent hardwood.

### Other Industrial

Other industrial products include poles, posts, mulch, excelsior, log homes, charcoal, and other reconstituted wood products. In 1990, combined output of roundwood used for these products totaled 2 million cubic feet (table 1). Valid comparisons in output of these products in 1987 and 1990 are not possible because the volume of composite panels was included in the other industrial products category prior to 1990. However, if the volume of composite panels was added in 1990, other industrial would probably show an increase instead of the decline shown in table 1.

## Number of Mills and Receipts

The number of sawmills operating in North Carolina decreased from 362 in 1987 to 308 in 1990 (table 2). Over the same period, receipts of saw logs dropped by 5 percent to 327 million cubic feet (table 3). Hardwood receipts accounted for the largest decline–13 percent–and totaled 107 million cubic feet. Yellow pine accounted for 64 percent of the total saw-log receipts (table 4). Hard hardwoods made up the next largest proportion, 20 percent of the receipts.

Since 1987, another veneer mill began production in North Carolina, bringing the total to 32 (table 2). Receipts of veneer logs totaled 79 million cubic feet and exceeded production by nearly 13 percent, or 9 million cubic feet. Receipts of hardwood increased almost 27 percent to nearly 32 million cubic feet, while those of softwood dropped nearly 11 percent (table 3). Still, softwood accounted for nearly 60 percent of the State's total veneer-log receipts. Yellow pines are still the species used most in the manufacturing of veneer (table 4). In 1990, nearly 60 percent of the 79 million cubic feet used was yellow pine. Soft hardwoods (mostly gum and poplar) accounted for nearly 36 percent, or 28 million cubic feet, of the State's total receipts.

There were eight pulpmills operating within the State during the period (table 2). Total receipts at these pulpmills increased well over 6 percent to 311 million cubic feet (table 3). Softwood pulpwood accounted for the largest proportion of the increase.

In 1990, the State had five composite panel mills with total receipts of nearly 29 million cubic feet (tables 2 and 3). Almost 16 million cubic feet of southern yellow pine, and well over 10 million cubic feet of soft hardwoods, mostly sweetgum, were used in the manufacture of composite panels (table 4).

In 1990, the State had 13 other industrial mills. These had receipts in excess of 2 million cubic feet (tables 2 and 3). Southern yellow pine accounted for 98 percent of the volume used by these mills (table 4).

## Roundwood Movement

North Carolina is a net exporter of industrial roundwood. In 1990, production of roundwood from North Carolina timberlands totaled over 764 million cubic feet, about 87 percent of which was retained for processing by mills within the State (table 5). Exports of roundwood to mills outside North Carolina totaled over 103 million cubic feet, an increase of nearly 5 percent since 1987. Imports from other States amounted to 87 million cubic feet, a decrease of 1 percent since 1987. Exports exceeded imports by 10 million cubic feet in 1987 and by nearly 16 million cubic feet in 1990. The volume of trees chipped in the woods and delivered to chip facilities for export overseas is not included in the estimate of roundwood harvested or exported. Forest Inventory and Analysis does not have the means to monitor this volume or to differentiate at export facilities between the volume of chips generated at chip facilities and the volume processed in the woods. Japan is very active in capacity expansion and has increased demand for hardwood chips used in high-grade specialty papers. The volume of hardwood chips exported from the Southern United States has grown in recent years, from 25,000 tons in 1987 to more than 1 million tons in 1990. Japanese, Korean, and Taiwanese wood-fiber companies are the primary purchasers.[1]

The State exported 6 percent of its saw-log production, nearly 20 million cubic feet, to mills in South Carolina and Virginia (tables 6 and 7). In return, mills in North Carolina imported 6 percent, or 20 million cubic feet, of their receipts from Georgia, South Carolina, Tennessee, and Virginia.

North Carolina is a net importer of veneer logs. In 1990, almost 11 million cubic feet of veneer logs were imported from Georgia, South Carolina, and Virginia. Other imports came from nine additional Eastern States as far north as Maine. More than 3 million cubic feet of veneer logs were exported to South Carolina and Virginia (tables 6 and 8).

Imports of roundwood for composite panel products account for well over 2 million cubic feet, or 9 percent, of receipts (table 6). Imports to composite panel mills in North Carolina came from Virginia and Tennessee with the bulk, over 2 million cubic feet, coming from Virginia (table 9). The State is a net exporter of roundwood used for composite panels. In 1990, 8 million cubic feet, or 23 percent of production, was exported to mills in Virginia. Hardwood made up 58 percent of export volume. Production exceeded receipts by 19 percent, or nearly 6 million cubic feet.

The State was a net exporter of roundwood pulpwood in 1990 (table 6). Production exceeded receipts by nearly 20 million cubic feet, or 6 percent. Total exports amounted to nearly 72 million cubic feet, or 22 percent of the production. Nearly 31 million cubic feet of softwood pulpwood was exported to South

[1]Colquitt, John. 1991. APA Technical Release 91-R-65. August.

Carolina. Other State's receiving North Carolina's pulpwood were Tennessee and Virginia, with Virginia receiving over 26 million cubic feet of hardwood roundwood pulpwood. Imports totaled 52 million cubic feet and accounted for nearly 17 percent of the pulpwood mill receipts. Fifty-four percent, or 28 million cubic feet, of these pulpwood imports came from South Carolina (table 10). Almost 12 million cubic feet, or 23 percent, came from Virginia, and the remainder was imported from Tennessee, Georgia, Kentucky, and West Virginia.

The State exported 7 percent, or 154 thousand cubic feet of roundwood used for other industrial products to mills in Virginia (tables 6 and 11). Mills in North Carolina, in return, imported about 6 percent, or 121 thousand cubic feet, of their receipts from South Carolina.

## Plant Byproducts

Mill residues from saw logs totaled 213 million cubic feet in 1990 (table 12) and accounted for 72 percent of the 295 million cubic feet of residues produced. Most of the 102 million cubic feet of coarse residues from saw logs were used in fiber products (table 13), while most of the bark and sawdust was used for industrial fuel. In 1990, most of the shavings from lumber were used for other miscellaneous products (bedding, landscaping, and other uses). In 1987, more of the shavings were used for the manufacture of particleboard. Less than 2 percent of the saw-log residues went unused in 1990.

Mill residues of all types generated from veneer logs amounted to over 41 million cubic feet in 1990 (table 12) and accounted for 14 percent of the total residues produced. Nearly 43 percent of the 26 million cubic feet of coarse residues were cores from veneer lathes sawn into landscape timbers and framing studs (table 13). The slabs from these cores and other coarse residues were chipped for use in fiber products. Most of the nearly 16 million cubic feet of sawdust and bark was used for industrial fuel. Less than 1 percent of the veneer residues went unused.

Over 34 million cubic feet of bark was extracted from roundwood pulpwood in 1990 (table 12). Most of this bark was used as industrial fuel. Less than 1 percent went unused.

For composite panel products, only bark is reported as residue because the entire main stem (minus the bark) is chipped and utilized. In 1990, bark residue from panel manufacturing totaled well over 2 million cubic feet and accounted for 3 percent of the bark from all products (table 12). Most of this bark was used for industrial fuel. Very little went unused. Residues of all types generated by other industrial mills totaled nearly 4 million cubic feet (table 12). Bark accounted for 83 percent of the residues generated. These residues were used primarily for industrial fuel.

## Regional Trends

Output of industrial roundwood products increased between 1987 and 1990 in the Northern Coastal Plain, Piedmont, and Mountain regions, but declined in the Southern Coastal Plain region (fig. 1). Hardwood output declined in the Southern Coastal Plain and Mountain regions. Softwood accounted for 60 percent or more of industrial roundwood products in all regions except the Mountain region, where hardwood accounted for 58 percent of the total output. Changes in output by product varied by region.

### Southern Coastal Plain

Output of pulpwood declined by 11 percent, or nearly 13 million cubic feet, in the 21-county Southern Coastal Plain region between 1987 and 1990. Volume of hardwood pulpwood declined by 14 percent, or 6 million cubic feet (table 14). Softwood pulpwood accounted for over 30 percent of total output of all timber products in 1987 but for only 29 percent in 1990. Total pulpwood production accounted for 104 million cubic feet, or 46 percent, of the region's total output of all industrial roundwood products in 1990, 4 percent less than in 1987. Production of saw logs rose almost 3 percent to nearly 78 million cubic feet in spite of the 21-percent decrease in production of hardwood saw logs. Output of hardwood saw logs dropped well over 3 million cubic feet, while that of softwood saw logs increased nearly 9 percent to nearly 65 million cubic feet. Total output of saw logs accounted for 34 percent of the region's total output of industrial roundwood products. The Southern Coastal Plain region produced 34 million cubic feet of veneer logs, 49 percent of the State's total. Hardwood

Note: Locations of mills within counties are not shown accurately.

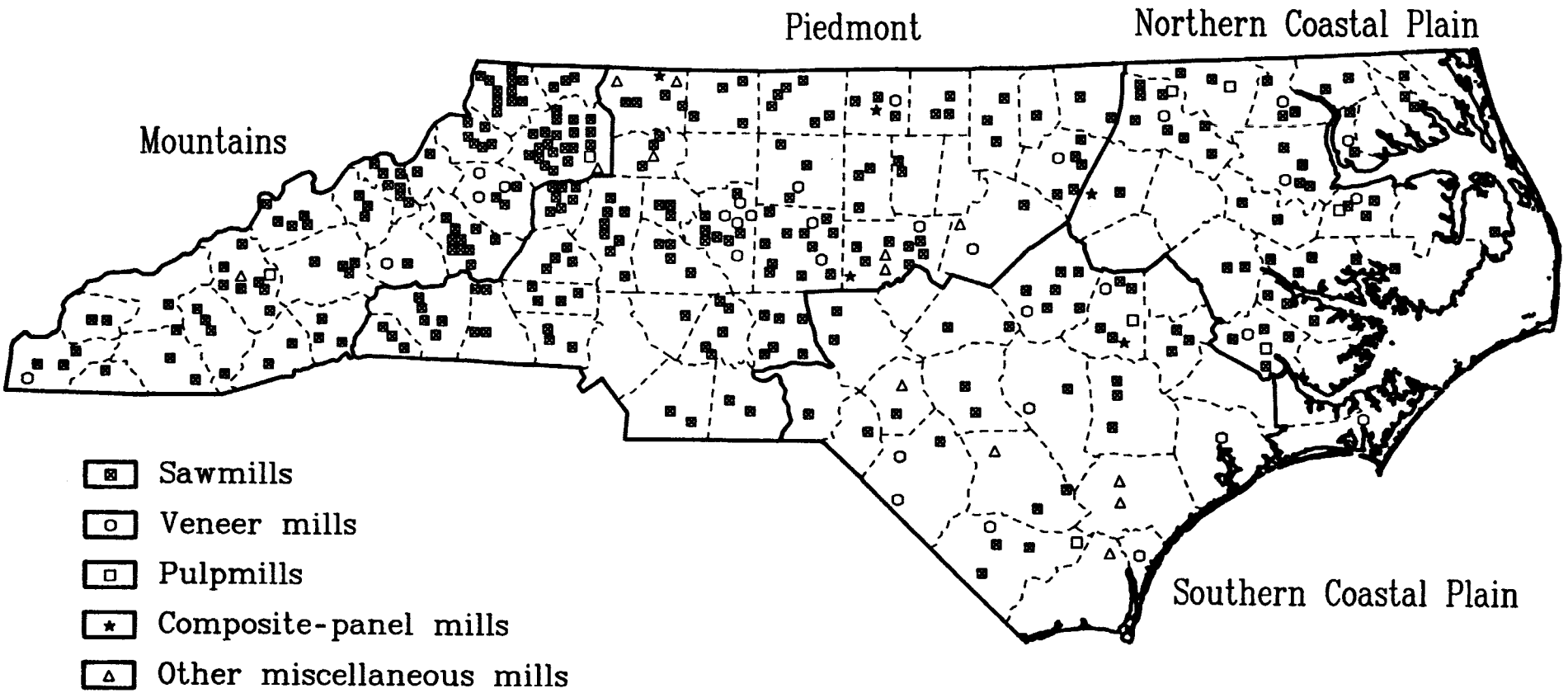


Figure 1–Locations of primary wood-using plants in North Carolina, 1990.

veneer output increased 67 percent, well over 3 million cubic feet, while softwood output declined by nearly 11 percent. In 1990, the Southern Coastal Plain region had 2 pulpmills, 32 sawmills, 9 veneer mills, 1 composite panel mill, and 5 other miscellaneous mills. These mills produced 225 million cubic feet of roundwood products. This production was 29 percent of the State's total. Only the Northern Coastal Plain produced more.

### Northern Coastal Plain

The 23-county Northern Coastal Plain produces more pulpwood than does any other region of North Carolina. The production of pulpwood increased here by 6 percent, to 132 million cubic feet, 40 percent of the State's total pulpwood output (table 15). Output of both softwood and hardwood pulpwood increased. Softwoods accounted for 62 percent of 1990 production. Pulpwood accounted for nearly 52 percent of the region's total output of roundwood products. Output of saw logs increased by 7 percent and totaled nearly 93 million cubic feet. The Northern Coastal Plain ranks second to the Piedmont in output of saw logs, producing 28 percent of the total for the State. Since 1987, output of softwood saw logs increased by 11 percent to nearly 74 million cubic feet and accounted for 79 percent of the regional total. Output of hardwood saw logs dropped by 5 percent to 19 million cubic feet. The Northern Coastal Plain is second to the Southern Coastal Plain in output of veneer. The region produced 32 percent of the State's veneer output in 1990. The output of hardwood veneer increased 10 percent to nearly 8 million cubic feet, while that of softwood veneer decreased by 9 percent. Softwood species still accounted for 66 percent of the region's veneer output. In 1990, the Northern Coastal Plain region had 4 pulpmills, 45 sawmills, 6 veneer mills, and 1 composite panel mill. These mills produced 256 million cubic feet of roundwood products. The Northern Coastal Plain region produced nearly 34 percent of the State's total output of industrial roundwood products, more than any other survey unit.

### Piedmont

The 35-county Piedmont region produces more roundwood for saw logs than any other region in the State. Production of both hardwood and softwood saw logs dropped in 1990, but still amounted to nearly 113 million cubic feet, or 34 percent of the statewide total (table 16). Saw logs made up nearly 58 percent of the region's total output of industrial roundwood products. Softwoods made up 63 percent of production of saw logs in 1987 and again in 1990. Pulpwood production increased almost 7 percent to nearly 56 million cubic feet in 1990. Production of both softwood and hardwood pulpwood increased, but softwoods still account for 61 percent of the pulpwood output. Pulpwood output in the Piedmont region accounted for only 17 percent of the State's total pulpwood production. Veneer-log output increased 17 percent to more than 9 million cubic feet, about 5 percent of the region's total output. Output of hardwood veneer increased 40 percent since 1987, while that of softwood veneer declined. In 1990, the Piedmont region had 130 sawmills, 12 veneer mills, 6 other miscellaneous mills, and 3 composite panel mills. These mills produced well over 195 million cubic feet of industrial roundwood products. The Piedmont accounted for nearly 26 percent of the State's total output of industrial roundwood products.

### Mountains

The output of pulpwood and veneer increased in the 21-county Mountain region, while that of saw logs decreased (table 17). Output of both softwood and hardwood saw logs was down in 1990. Total output of saw logs was down by 17 percent to nearly 44 million cubic feet, but still amounted to nearly 50 percent of the region's total output of roundwood products. Hardwoods accounted for 69 percent of the region's output of saw logs in 1990. Pulpwood output was well over 38 million cubic feet in 1990, almost 44 percent more than in 1987. Softwood pulpwood output increased nearly 92 percent and accounted for nearly 57 percent of the pulpwood production in the region. Output of veneer logs increased nearly 36 percent to almost 4 million cubic feet in 1990. Output of hardwood veneer increased nearly 25 percent and accounted for 92 percent of the region's veneer output. In 1990, the Mountain region had 101 sawmills, 5 veneer mills, 2 pulpmills, and 2 other miscellaneous mills, and these mills produced nearly 88 million cubic feet of roundwood products. The Mountain region accounted for nearly 12 percent of the State's total output of roundwood products.

## Definitions of Terms

**Composite panels**. Consists of structural panels (oriented strand board or waferboard), particleboard (industrial underlayment, thin panelboard), and fiberboard (medium-density fiberboard, insulation board).

**Consumption**. The quantity of a commodity, such as pulpwood, utilized.

**Drain.** The volume of roundwood removed from any geographic area where timber is grown.

**Exports**. The volume of roundwood utilized by mills outside the geographic area where timber was cut.

**Industrial roundwood products**. Any primary use of the main stem of a tree, such as saw logs, poles, pilings, veneer logs, pulpwood, posts, or cooperage logs.

**Industrial timber products**. All timber products manufactured from either roundwood or plant byproducts, except firewood.

**Imports**. The volume of roundwood delivered to a mill or group of mills in a specific geographic area but harvested from outside that particular area.

**Plant residues**. Wood material generated in the production of timber products at primary manufacturing plants.

*Coarse residues*. Suitable for chipping such as slabs, edgings, trim, veneer cores, and ends.

*Fine residues*. Not suitable for chipping such as sawdust, shavings, and veneer clippings.

**Primary wood-using plants**. Industries that receive roundwood or chips from roundwood for the manufacture of products such as veneer, pulp, and lumber.

**Receipts**. The quantity or volume of industrial roundwood received at a mill or by a group of mills in a geographic area, regardless of the geographic source. Volume of roundwood receipts is equal to the volume of roundwood retained in a geographic location plus roundwood imported from other locations.

**Roundwood**. Logs, bolts, or other round sections cut from trees for industrial manufacture or consumer use.

**Roundwood chipped**. Any timber cut primarily for industrial manufacture, delivered to non-pulpmills, chipped, and then sold to pulpmills for use as fiber. Includes tops, jump sections, and whole trees.

**Roundwood product drain**. That portion of total drain used for a product.

**Saw log**. A log meeting minimum standards of diameter, length, and defect, including logs at least 8 feet long, sound and straight, and with a minimum diameter inside bark of 6 inches for softwoods and 8 inches for hardwoods.

**Timber products output**. Roundwood production in an area's forests (equals roundwood product drain).

**Timber removals**. The merchantable volume of trees removed from the timberland inventory by harvesting, cultural operations such as stand improvement, land clearing, or changes in land use.

**Veneer log**. Logs to be used in the production of plywood, finished panels, or veneer sheets, both rotary cut and sliced.

## Conversion Factors[a]

| | |
|---|---|
| **Saw logs** | |
| Softwood | 0.17095 cubic foot = 1 board foot |
| | 5.85 board feet = 1 cubic foot |
| Hardwood | 0.16890 cubic foot = 1 board foot |
| | 5.92 board feet = 1 cubic foot |
| **Veneer logs** | |
| Softwood | 0.16591 cubic foot = 1 board foot |
| | 6.03 board feet = 1 cubic foot |
| Hardwood | 0.16547 cubic foot = 1 board foot |
| | 6.04 board feet = 1 cubic foot |
| **Composite panels** | |
| Softwood | 0.17095 cubic feet = 1 board foot |
| | 5.85 board feet = 1 cubic foot |
| Hardwood | 0.16890 cubic feet = 1 board foot |
| | 5.92 board feet = 1 cubic foot |
| **Pulpwood[b]** | |
| Softwood | 76.7 cubic feet/cord |
| Hardwood | 76.4 cubic feet/cord |

[a]Conversion factors vary with stem size (d.b.h.) and species. The factors shown are for trees of average diameters removed in North Carolina during the latest survey period.

[b]Cubic feet of solid wood per cord.

# Tables

**Table 1--Roundwood timber products output, by product and species group, North Carolina, 1987 and 1990**

| Product and species group | Year | | Change |
|---|---|---|---|
| | 1987 | 1990 | |
| | Thousand cubic feet | | Percent |
| **Saw logs** | | | |
| Softwood | 215,719 | 223,254 | +3.5 |
| Hardwood | 115,382 | 103,440 | -10.3 |
| Total | 331,101 | 326,694 | -1.3 |
| **Veneer logs** | | | |
| Softwood | 48,892 | 44,100 | -9.8 |
| Hardwood | 19,402 | 26,038 | +34.2 |
| Total | 68,294 | 70,138 | +2.7 |
| **Pulpwood**[a] | | | |
| Softwood | 194,421 | 203,651 | +4.7 |
| Hardwood | 126,115 | 127,084 | +.8 |
| Total | 320,536 | 330,735 | +3.2 |
| **Composite panels**[b] | | | |
| Softwood | NA | 18,159 | NA |
| Hardwood | NA | 16,362 | NA |
| Total | NA | 34,521 | NA |
| **Other industrial** | | | |
| Softwood | 13,456 | 2,047 | -84.8 |
| Hardwood | 13,728 | 37 | -99.7 |
| Total | 27,184 | 2,084 | -92.3 |
| **All industrial** | | | |
| Softwood | 472,488 | 491,211 | +4.0 |
| Hardwood | 274,627 | 272,961 | -.6 |
| Total | 747,115 | 764,172 | +2.3 |

NA = Not applicable.

[a]Includes roundwood that was delivered to non-pulpmills and then chipped and sold to pulpmills (22,683,000 cubic feet in 1987 and 11,760,000 cubic feet in 1990).

[b]Volume included with other industrial prior to 1990.

**Table 2--Number of primary wood-using plants, by industry, North Carolina, 1987 and 1990**

| Industry | Year | | Change |
|---|---|---|---|
| | 1987 | 1990 | |
| | Number | | Percent |
| Sawmills | 362 | 308 | -14.9 |
| Veneer mills | 31 | 32 | +3.2 |
| Pulpmills | 8 | 8 | 0 |
| Composite-panel mills[a] | NA | 5 | NA |
| Other | 21 | 13 | -38.1 |
| All plants | 422 | 366 | -13.3 |

NA = Not applicable.

[a]Mills included with other prior to 1990.

**Table 3--Roundwood receipts, by product and species group, North Carolina, 1987 and 1990**

| Product and species group | Year | | Change |
|---|---|---|---|
| | 1987 | 1990 | |
| | Thousand cubic feet | | Percent |
| **Saw logs** | | | |
| Softwood | 221,853 | 219,862 | -0.9 |
| Hardwood | 123,101 | 107,206 | -12.9 |
| Total | 344,954 | 327,068 | -5.2 |
| **Veneer logs** | | | |
| Softwood | 53,090 | 47,406 | -10.7 |
| Hardwood | 24,950 | 31,654 | +26.9 |
| Total | 78,040 | 79,060 | +1.3 |
| **Pulpwood**[a] | | | |
| Softwood | 183,529 | 203,630 | +11.0 |
| Hardwood | 108,598 | 107,469 | -1.0 |
| Total | 292,127 | 311,099 | +6.5 |
| **Composite panels**[b] | | | |
| Softwood | NA | 15,926 | NA |
| Hardwood | NA | 13,017 | NA |
| Total | NA | 28,943 | NA |
| **Other industrial** | | | |
| Softwood | 10,594 | 2,014 | -81.0 |
| Hardwood | 11,377 | 37 | -99.7 |
| Total | 21,971 | 2,051 | -90.7 |
| **All industrial** | | | |
| Softwood | 469,066 | 488,838 | +4.2 |
| Hardwood | 268,026 | 259,383 | -3.2 |
| Total | 737,092 | 748,221 | +1.5 |

NA = Not applicable.

[a]Includes roundwood that was delivered to non-pulpmills and then chipped and sold to pulpmills (25,406,000 cubic feet in 1987 and 12,949,000 cubic feet in 1990).

[b]Volume included with other industrial prior to 1990.

**Table 4--Roundwood receipts by species and type of mill, North Carolina, 1990**

| Species | Type of mill | | | | | |
|---|---|---|---|---|---|---|
| | All mills | Sawmills | Veneer mills | OSB and panels | Pulpmills[a] | Other mills |
| | Thousand cubic feet | | | | | |
| **Softwood** | | | | | | |
| Yellow pine | 274,573 | 209,527 | 47,228 | 15,804 | NA | 2,014 |
| Other softwood | 10,635 | 10,335 | 178 | 122 | NA | 0 |
| Unclassified | 203,630 | 0 | 0 | 0 | 203,630 | 0 |
| Total softwoods | 488,838 | 219,862 | 47,406 | 15,926 | 203,630 | 2,014 |
| **Hardwood** | | | | | | |
| Soft hardwoods | 78,995 | 40,425 | 28,116 | 10,454 | NA | 0 |
| Hard hardwoods | 72,919 | 66,781 | 3,538 | 2,563 | NA | 37 |
| Unclassified | 107,469 | 0 | 0 | 0 | 107,469 | 0 |
| Total hardwoods | 259,383 | 107,206 | 31,654 | 13,017 | 107,469 | 37 |
| **All species** | 748,221 | 327,068 | 79,060 | 28,943 | 311,099 | 2,051 |

NA = Not applicable.

[a]Only collected by softwood and hardwood and includes roundwood chipped.

**Table 5--Industrial roundwood movement, by year and species group, North Carolina, 1987 and 1990**

| Year | Production | Exports | Retained | Imports | Receipts |
|---|---|---|---|---|---|
| | | | Thousand cubic feet | | |
| | | | **SOFTWOOD** | | |
| 1987 | 472,488 | 61,359 | 411,129 | 57,937 | 469,066 |
| 1990 | 491,211 | 61,249 | 429,962 | 58,876 | 488,838 |
| | | | **HARDWOOD** | | |
| 1987 | 274,627 | 36,872 | 237,755 | 30,271 | 268,026 |
| 1990 | 272,961 | 41,825 | 231,136 | 28,247 | 259,383 |
| | | | **ALL SPECIES** | | |
| 1987 | 747,115 | 98,231 | 648,884 | 88,208 | 737,092 |
| 1990 | 764,172 | 103,074 | 661,098 | 87,123 | 748,221 |

**Table 6--Industrial roundwood movement by product and species group, North Carolina, 1990**

| Product and species group | Production | Exports | Retained | Imports | Receipts |
|---|---|---|---|---|---|
| | | | Thousand cubic feet | | |
| **Saw logs** | | | | | |
| Softwood | 223,254 | 15,705 | 207,549 | 12,313 | 219,862 |
| Hardwood | 103,440 | 4,077 | 99,363 | 7,843 | 107,206 |
| Total | 326,694 | 19,782 | 306,912 | 20,156 | 327,068 |
| **Veneer logs** | | | | | |
| Softwood | 44,100 | 2,882 | 41,218 | 6,188 | 47,406 |
| Hardwood | 26,038 | 549 | 25,489 | 6,165 | 31,654 |
| Total | 70,138 | 3,431 | 66,707 | 12,353 | 79,060 |
| **Pulpwood**[a] | | | | | |
| Softwood | 203,651 | 39,105 | 164,546 | 39,084 | 203,630 |
| Hardwood | 127,084 | 32,526 | 94,558 | 12,911 | 107,469 |
| Total | 330,735 | 71,631 | 259,104 | 51,995 | 311,099 |
| **Composite panels** | | | | | |
| Softwood | 18,159 | 3,403 | 14,756 | 1,170 | 15,926 |
| Hardwood | 16,362 | 4,673 | 11,689 | 1,328 | 13,017 |
| Total | 34,521 | 8,076 | 26,445 | 2,498 | 28,943 |
| **Other industrial** | | | | | |
| Softwood | 2,047 | 154 | 1,893 | 121 | 2,014 |
| Hardwood | 37 | 0 | 37 | 0 | 37 |
| Total | 2,084 | 154 | 1,930 | 121 | 2,051 |
| **All products** | | | | | |
| Softwood | 491,211 | 61,249 | 429,962 | 58,876 | 488,838 |
| Hardwood | 272,961 | 41,825 | 231,136 | 28,247 | 259,383 |
| Total | 764,172 | 103,074 | 661,098 | 87,123 | 748,221 |

[a]Includes roundwood chipped.

**Table 7--Saw log volume by destination, source, and species group, North Carolina, 1990**

| Destination and source | Species group | | |
|---|---|---|---|
| | All species | Softwood | Hardwood |
| | Thousand cubic feet | | |
| **North Carolina (retained)** | 306,912 | 207,549 | 99,363 |
| **Exports to:** | | | |
| South Carolina | 9,232 | 7,820 | 1,412 |
| Virginia | 10,550 | 7,885 | 2,665 |
| **Imports from:** | | | |
| Georgia | 851 | 212 | 639 |
| South Carolina | 6,755 | 5,216 | 1,539 |
| Tennessee | 909 | 128 | 781 |
| Virginia | 11,641 | 6,757 | 4,884 |

**Table 8--Veneer volume by destination, source, and species group, North Carolina, 1990**

| Destination and source | Species group | | |
|---|---|---|---|
| | All species | Softwood | Hardwood |
| | Thousand cubic feet | | |
| **North Carolina (retained)** | 66,707 | 41,218 | 25,489 |
| **Exports to:** | | | |
| South Carolina | 357 | 102 | 255 |
| Virginia | 3,074 | 2,780 | 294 |
| **Imports from:** | | | |
| Georgia | 109 | 0 | 109 |
| Kentucky | 72 | 0 | 72 |
| Maine | 23 | 0 | 23 |
| Maryland | 296 | 0 | 296 |
| New York | 23 | 0 | 23 |
| Ohio | 11 | 0 | 11 |
| Pennsylvania | 95 | 0 | 95 |
| South Carolina | 7,030 | 6,125 | 905 |
| Tennessee | 916 | 0 | 916 |
| Vermont | 23 | 0 | 23 |
| Virginia | 3,475 | 63 | 3,412 |
| West Virginia | 280 | 0 | 280 |

**Table 9--Composite panel volume by destination, source, and species group, North Carolina, 1990**

| Destination and source | Species group | | |
|---|---|---|---|
| | All species | Softwood | Hardwood |
| | Thousand cubic feet | | |
| **North Carolina (retained)** | 26,445 | 14,756 | 11,689 |
| **Exports to:** | | | |
| Virginia | 8,076 | 3,403 | 4,673 |
| **Imports from:** | | | |
| Tennessee | 101 | 101 | 0 |
| Virginia | 2,397 | 1,069 | 1,328 |

**Table 10--Pulpwood[a] volume by destination, source, and species group, North Carolina, 1990**

| Destination and source | Species group | | |
|---|---|---|---|
| | All species | Softwood | Hardwood |
| | Thousand cubic feet | | |
| **North Carolina (retained)** | 259,104 | 164,546 | 94,558 |
| **Exports to:** | | | |
| South Carolina | 37,026 | 30,853 | 6,173 |
| Tennessee | 1,819 | 1,819 | 0 |
| Virginia | 32,786 | 6,433 | 26,353 |
| **Imports from:** | | | |
| Georgia | 7,627 | 5,431 | 2,196 |
| Kentucky | 9 | 0 | 9 |
| South Carolina | 28,009 | 22,408 | 5,601 |
| Tennessee | 4,537 | 1,434 | 3,103 |
| Virginia | 11,804 | 9,811 | 1,993 |
| West Virginia | 9 | 0 | 9 |

[a]Includes roundwood chipped.

**Table 11--Other industrial[a] volume by destination, source, and species group, North Carolina, 1990**

| Destination and source | Species group | | |
|---|---|---|---|
| | All species | Softwood | Hardwood |
| | Thousand cubic feet | | |
| **North Carolina (retained)** | 1,930 | 1,893 | 37 |
| **Exports to:** | | | |
| Virginia | 154 | 154 | 0 |
| **Imports from:** | | | |
| South Carolina | 121 | 121 | 0 |

[a]Includes poles, posts, mulch, firewood, log homes, charcoal, and all other industrial mills.

Table 12--Primary mill residue volume by roundwood type, species group, and residue type, North Carolina, 1990

| Roundwood type and species group | Residue type | | | | |
|---|---|---|---|---|---|
| | All types | Bark | Coarse | Sawdust | Shavings |
| | Thousand cubic feet | | | | |
| **Saw logs** | | | | | |
| Softwood | 147,720 | 16,447 | 69,491 | 43,498 | 18,284 |
| Hardwood | 65,535 | 10,911 | 32,036 | 21,528 | 1,060 |
| Total | 213,255 | 27,358 | 101,527 | 65,026 | 19,344 |
| **Veneer logs** | | | | | |
| Softwood | 28,537 | 3,623 | 18,912 | 6,002 | 0 |
| Hardwood | 12,821 | 3,264 | 6,861 | 2,696 | 0 |
| Total | 41,358 | 6,887 | 25,773 | 8,698 | 0 |
| **Pulpwood** | | | | | |
| Softwood | 21,042 | 21,042 | 0 | 0 | 0 |
| Hardwood | 13,292 | 13,292 | 0 | 0 | 0 |
| Total | 34,334 | 34,334 | 0 | 0 | 0 |
| **Composite panels** | | | | | |
| Softwood | 1,190 | 1,190 | 0 | 0 | 0 |
| Hardwood | 1,321 | 1,321 | 0 | 0 | 0 |
| Total | 2,511 | 2,511 | 0 | 0 | 0 |
| **Other industrial**[a] | | | | | |
| Softwood | 3,821 | 3,172 | 649 | 0 | 0 |
| Hardwood | 21 | 5 | 11 | 5 | 0 |
| Total | 3,842 | 3,177 | 660 | 5 | 0 |
| **Total** | | | | | |
| Softwood | 202,310 | 45,474 | 89,052 | 49,500 | 18,284 |
| Hardwood | 92,990 | 28,793 | 38,908 | 24,229 | 1,060 |
| Total | 295,300 | 74,267 | 127,960 | 73,729 | 19,344 |

[a]Includes poles, pilings, posts, and other industrial products.

Table 13--Disposal of residue at primary wood-using plants, by product, species group, and type of residue, North Carolina, 1987 and 1990

| Product and species group | All types | | Bark | | Coarse | | Sawdust | | Shavings | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1987 | 1990 | 1987 | 1990 | 1987 | 1990 | 1987 | 1990 | 1987 | 1990 |
| | Thousand cubic feet | | | | | | | | | |
| **Fiber products** | | | | | | | | | | |
| Softwood | 83,554 | 72,509 | 0 | 0 | 78,170 | 72,484 | 2,141 | 25 | 3,243 | 0 |
| Hardwood | 28,909 | 24,954 | 13 | 0 | 28,601 | 24,890 | 158 | 64 | 137 | 0 |
| Total | 112,463 | 97,463 | 13 | 0 | 106,771 | 97,374 | 2,299 | 89 | 3,380 | 0 |
| **Particleboard** | | | | | | | | | | |
| Softwood | 12,027 | 10,114 | 0 | 0 | 4,583 | 1,175 | 1,988 | 5,078 | 5,456 | 3,861 |
| Hardwood | 8,124 | 4,719 | 23 | 0 | 6,967 | 3,106 | 1,025 | 1,304 | 109 | 309 |
| Total | 20,151 | 14,833 | 23 | 0 | 11,550 | 4,281 | 3,013 | 6,382 | 5,565 | 4,170 |
| **Strand or wafer board**[a] | | | | | | | | | | |
| Softwood | NA | 582 | NA | 0 | NA | 582 | NA | 0 | NA | 0 |
| Hardwood | NA | 744 | NA | 0 | NA | 744 | NA | 0 | NA | 0 |
| Total | NA | 1,326 | NA | 0 | NA | 1,326 | NA | 0 | NA | 0 |
| **Sawn products** | | | | | | | | | | |
| Softwood | 9,877 | 8,100 | 0 | 0 | 9,877 | 8,100 | 0 | 0 | 0 | 0 |
| Hardwood | 369 | 2,949 | 0 | 0 | 369 | 2,949 | 0 | 0 | 0 | 0 |
| Total | 10,246 | 11,049 | 0 | 0 | 10,246 | 11,049 | 0 | 0 | 0 | 0 |
| **Fuel** | | | | | | | | | | |
| Softwood | 80,678 | 79,363 | 29,767 | 34,832 | 3,375 | 5,757 | 43,735 | 33,469 | 3,801 | 5,305 |
| Hardwood | 52,778 | 49,158 | 22,673 | 23,307 | 8,133 | 6,415 | 21,492 | 18,919 | 480 | 517 |
| Total | 133,456 | 128,521 | 52,440 | 58,139 | 11,508 | 12,172 | 65,227 | 52,388 | 4,281 | 5,822 |
| **Miscellaneous** | | | | | | | | | | |
| Softwood | 23,618 | 28,727 | 11,732 | 9,277 | 443 | 376 | 7,256 | 9,957 | 4,187 | 9,117 |
| Hardwood | 10,610 | 8,040 | 5,608 | 4,476 | 232 | 142 | 4,090 | 3,188 | 680 | 234 |
| Total | 34,228 | 36,767 | 17,340 | 13,753 | 675 | 518 | 11,346 | 13,145 | 4,867 | 9,351 |
| **Not used** | | | | | | | | | | |
| Softwood | 3,843 | 2,915 | 1,499 | 1,365 | 930 | 578 | 1,346 | 971 | 68 | 1 |
| Hardwood | 3,316 | 2,426 | 1,420 | 1,010 | 681 | 662 | 1,180 | 754 | 35 | 0 |
| Total | 7,159 | 5,341 | 2,919 | 2,375 | 1,611 | 1,240 | 2,526 | 1,725 | 103 | 1 |
| **All products** | | | | | | | | | | |
| Softwood | 213,597 | 202,310 | 42,998 | 45,474 | 97,378 | 89,052 | 56,466 | 49,500 | 16,755 | 18,284 |
| Hardwood | 104,106 | 92,990 | 29,737 | 28,793 | 44,983 | 38,908 | 27,945 | 24,229 | 1,441 | 1,060 |
| Total | 317,703 | 295,300 | 72,735 | 74,267 | 142,361 | 127,960 | 84,411 | 73,729 | 18,196 | 19,344 |

NA = Not applicable.

[a]Volume included with miscellaneous prior to 1990.

**Table 14--Output of industrial roundwood products, by product and species group, Southern Coastal Plain of North Carolina, 1987 and 1990**

| Product and species group | Year | | Change |
|---|---|---|---|
| | 1987 | 1990 | |
| | Thousand cubic feet | | Percent |
| **Saw logs** | | | |
| Softwood | 59,490 | 64,756 | +8.9 |
| Hardwood | 16,187 | 12,784 | -21.0 |
| Total | 75,677 | 77,540 | +2.5 |
| **Veneer logs** | | | |
| Softwood | 28,922 | 25,836 | -10.7 |
| Hardwood | 5,070 | 8,473 | +67.1 |
| Total | 33,992 | 34,309 | +.9 |
| **Pulpwood**[a] | | | |
| Softwood | 71,839 | 65,370 | -9.0 |
| Hardwood | 45,306 | 38,889 | -14.2 |
| Total | 117,145 | 104,259 | -11.0 |
| **Composite panels**[b] | | | |
| Softwood | NA | 5,202 | NA |
| Hardwood | NA | 2,162 | NA |
| Total | NA | 7,364 | NA |
| **Other industrial** | | | |
| Softwood | 4,635 | 1,531 | -67.0 |
| Hardwood | 4,098 | 0 | -100.0 |
| Total | 8,733 | 1,531 | -82.5 |
| **All industrial** | | | |
| Softwood | 164,886 | 162,695 | -1.3 |
| Hardwood | 70,661 | 62,308 | -11.8 |
| Total | 235,547 | 225,003 | -4.5 |

NA = Not applicable.

[a]Includes roundwood that was delivered to non-pulpmills and then chipped and sold to pulpmills (7,044,000 cubic feet in 1987 and 4,987,000 cubic feet in 1990).

[b]Volume included with other industrial prior to 1990.

**Table 15--Output of industrial roundwood products, by product and species group, Northern Coastal Plain of North Carolina, 1987 and 1990**

| Product and species group | Year | | Change |
|---|---|---|---|
| | 1987 | 1990 | |
| | Thousand cubic feet | | Percent |
| **Saw logs** | | | |
| Softwood | 66,342 | 73,612 | +11.0 |
| Hardwood | 20,409 | 19,342 | -5.2 |
| Total | 86,751 | 92,954 | +7.2 |
| **Veneer logs** | | | |
| Softwood | 16,631 | 15,064 | -9.4 |
| Hardwood | 6,884 | 7,590 | +10.3 |
| Total | 23,515 | 22,654 | -3.7 |
| **Pulpwood**[a] | | | |
| Softwood | 78,476 | 82,309 | +4.9 |
| Hardwood | 45,927 | 50,017 | +8.9 |
| Total | 124,403 | 132,326 | +6.4 |
| **Composite panels**[b] | | | |
| Softwood | NA | 2,883 | NA |
| Hardwood | NA | 5,081 | NA |
| Total | NA | 7,964 | NA |
| **Other industrial** | | | |
| Softwood | 3,137 | 115 | -96.3 |
| Hardwood | 4,315 | 0 | -100.0 |
| Total | 7,452 | 115 | -98.5 |
| **All industrial** | | | |
| Softwood | 164,586 | 173,983 | +5.7 |
| Hardwood | 77,535 | 82,030 | +5.8 |
| Total | 242,121 | 256,013 | +5.7 |

NA = Not applicable.

[a]Includes roundwood that was delivered to non-pulpmills and then chipped and sold to pulpmills (7,181,000 cubic feet in 1987 and 2,965,000 cubic feet in 1990).

[b]Volume included with other industrial prior to 1990.

Table 16--Output of industrial roundwood products, by product and species group, Piedmont of North Carolina, 1987 and 1990

| Product and species group | Year | | Change |
|---|---|---|---|
| | 1987 | 1990 | |
| | Thousand cubic feet | | Percent |
| **Saw logs** | | | |
| Softwood | 73,078 | 71,416 | -2.3 |
| Hardwood | 42,990 | 41,148 | -4.3 |
| Total | 116,068 | 112,564 | -3.0 |
| **Veneer logs** | | | |
| Softwood | 3,339 | 2,872 | -14.0 |
| Hardwood | 4,526 | 6,338 | +40.0 |
| Total | 7,865 | 9,210 | +17.1 |
| **Pulpwood**[a] | | | |
| Softwood | 32,753 | 34,184 | +4.4 |
| Hardwood | 19,470 | 21,519 | +10.5 |
| Total | 52,223 | 55,703 | +6.7 |
| **Composite panels**[b] | | | |
| Softwood | NA | 8,726 | NA |
| Hardwood | NA | 8,584 | NA |
| Total | NA | 17,310 | NA |
| **Other industrial** | | | |
| Softwood | 5,174 | 382 | -92.6 |
| Hardwood | 4,794 | 32 | -99.3 |
| Total | 9,968 | 414 | -95.8 |
| **All industrial** | | | |
| Softwood | 114,344 | 117,580 | +2.8 |
| Hardwood | 71,780 | 77,621 | +8.1 |
| Total | 186,124 | 195,201 | +4.9 |

NA = Not applicable.

[a]Includes roundwood that was delivered to non-pulpmills and then chipped and sold to pulpmills (6,694,000 cubic feet in 1987 and 3,441,000 cubic feet in 1990).

[b]Volume included with other industrial prior to 1990.

**Table 17--Output of industrial roundwood products, by product and species group, Mountains of North Carolina, 1987 and 1990**

| Product and species group | Year | | Change |
|---|---|---|---|
| | 1987 | 1990 | |
| | Thousand cubic feet | | Percent |
| **Saw logs** | | | |
| Softwood | 16,809 | 13,470 | -19.9 |
| Hardwood | 35,796 | 30,166 | -15.7 |
| Total | 52,605 | 43,636 | -17.1 |
| **Veneer logs** | | | |
| Softwood | 0 | 328 | +100.0 |
| Hardwood | 2,922 | 3,637 | +24.5 |
| Total | 2,922 | 3,965 | +35.7 |
| **Pulpwood**[a] | | | |
| Softwood | 11,353 | 21,788 | +91.9 |
| Hardwood | 15,412 | 16,659 | +8.1 |
| Total | 26,765 | 38,447 | +43.6 |
| **Composite panels**[b] | | | |
| Softwood | NA | 1,348 | NA |
| Hardwood | NA | 535 | NA |
| Total | NA | 1,883 | NA |
| **Other industrial** | | | |
| Softwood | 510 | 19 | -96.3 |
| Hardwood | 521 | 5 | -99.0 |
| Total | 1,031 | 24 | -97.7 |
| **All industrial** | | | |
| Softwood | 28,672 | 36,953 | +28.9 |
| Hardwood | 54,651 | 51,002 | -6.7 |
| Total | 83,323 | 87,955 | +5.6 |

NA = Not applicable.

[a]Includes roundwood that was delivered to non-pulpmills and then chipped and sold to pulpmills (1,764,000 cubic feet in 1987 and 367,000 cubic feet in 1990).

[b]Volume included with other industrial prior to 1990.

**Davenport, Edgar L. 1992.** Changes in North Carolina's industrial roundwood products output, 1987-1990. Resour. Bull. SE-132. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southeastern Forest Experiment Station. 22 pp.

Over 764 million cubic feet of industrial roundwood products were harvested from North Carolina's forests during 1990, approximately 17 million cubic feet more than in 1987. Pulpwood accounted for 43 percent and saw logs 43 percent of the total roundwood production. Output of byproducts dropped from nearly 318 million cubic feet in 1987 to 295 million cubic feet in 1990. A little over 5 million cubic feet of residues, nearly 2 percent of the total produced, were not used. A total of 366 primary wood-using plants operated in the State during 1990. Mill receipts of more than 748 million cubic feet were 2 percent less than the State's production. The State was a net exporter of industrial roundwood.

KEYWORDS: Saw logs, pulpwood, veneer logs, mill residues.

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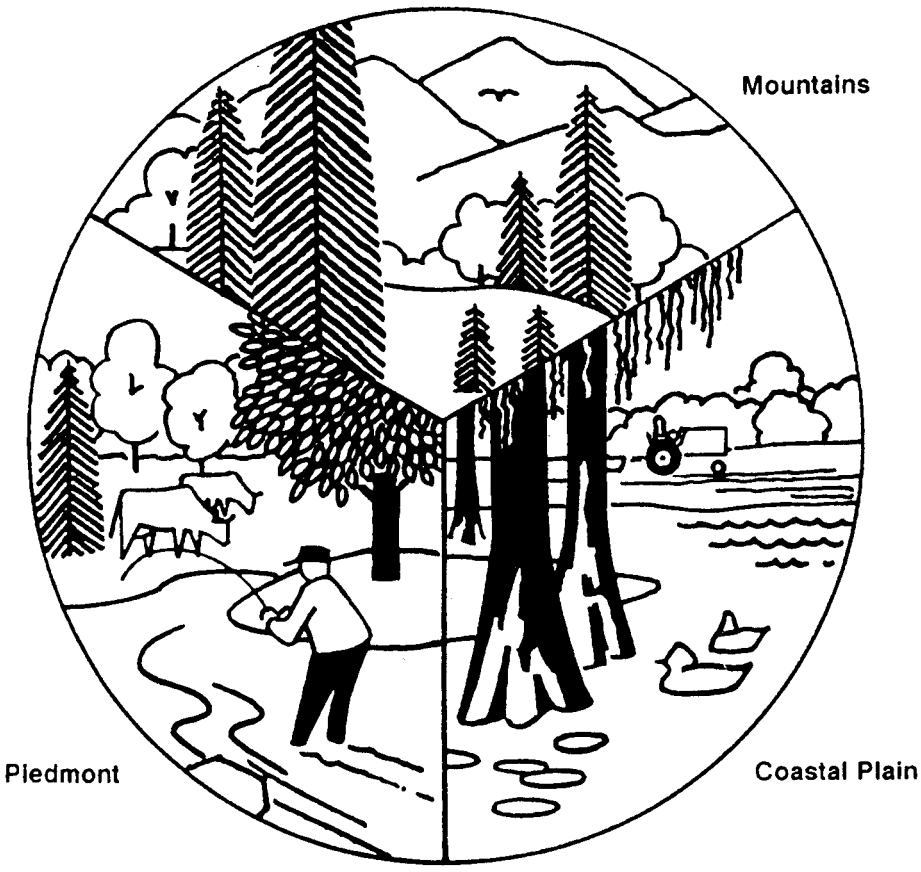


# Southeastern Forest Experiment Station

**Established 1921**

The Southeastern Forest Experiment Station, headquartered in Asheville, North Carolina, is one of the eight regional Experiment Stations, and the Forest Products Laboratory, that make up the Forest Service research organization.

**RESEARCH MISSION:**

To acquire the knowledge, develop the technology, and disseminate the research findings required to manage the Southeast's forest resources in ways that satisfy demands of goods and services while maintaining a quality environment.

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